

**AMENDMENTS TO THE CLAIMS**

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1. (original): A process for producing a catalyst for  $\alpha$ -olefin polymerization, which comprises the step of contacting (1) a solid catalyst component having Ti, Mg and a halogen as essential components, (2) an organoaluminum compound and (3) a compound having a -C-O-C-O-C- bond group in a closed ring structure with one another.

2. (original): The process for producing a catalyst for  $\alpha$ -olefin polymerization according to Claim 1, wherein the solid catalyst component further has an organic acid ester or an ether.

3. (original): The process for producing a catalyst for  $\alpha$ -olefin polymerization according to Claim 1, wherein the solid catalyst component is produced by a process comprising the step of contacting (1) a solid component having a magnesium atom, a titanium atom and a hydrocarboxy group, (2) a halogen compound having halogenation ability and (3) an electron donor and/or an organic acid halide.

4. (original): A process for producing an  $\alpha$ -olefin polymer, which comprises the step of homopolymerizing or copolymerizing an  $\alpha$ -olefin in the presence of a catalyst for  $\alpha$ -olefin polymerization produced by the process according to Claim 1.

5-9. (canceled).

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10. (original): A process for producing a catalyst for  $\alpha$ -olefin polymerization, which comprises the step of contacting (1) a solid catalyst component having Ti, Mg and a halogen as essential components, (2) an organoaluminum compound, (3) a compound having a -C-O-C-O-C- bond group and (4) a 1,3-diether compound with one another.

11. (original): The process for producing a catalyst for  $\alpha$ -olefin polymerization according to Claim 10, wherein the compound having a -C-O-C-O-C- bond group contains a compound having a -C-O-C-O-C- bond group in a closed ring structure.

12. (original): The process for producing a catalyst for  $\alpha$ -olefin polymerization according to Claim 10, wherein the solid catalyst component further has an organic acid ester or an ether.

13. (original): The process for producing a catalyst for  $\alpha$ -olefin polymerization according to Claim 10, wherein the solid catalyst component is produced by a process comprising the step of contacting (1) a solid component having a magnesium atom, a titanium atom and a hydrocarbyloxy group, (2) a halogenocompound having halogenation ability and (3) an electron donor and/or an organic acid halide.

14. (original): A process for producing an  $\alpha$ -olefin polymer, which comprises the step of homopolymerizing or copolymerizing an  $\alpha$ -olefin in the presence of a catalyst for  $\alpha$ -olefin polymerization produced by the process according to Claim 10.

15. (original): A process for producing a catalyst for  $\alpha$ -olefin polymerization, which comprises the step of contacting (1) a solid catalyst component having Ti, Mg and a halogen as

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essential components, (2) an organoaluminum compound, (3) a compound having a -C-O-C-O-C- bond group and (4) a piperidine compound with one another.

16. (original): The process for producing a catalyst for  $\alpha$ -olefin polymerization according to Claim 15, wherein the compound having a -C-O-C-O-C- bond group contains a compound having a -C-O-C-O-C- bond group in a closed ring structure.

17. (original): The process for producing a catalyst for  $\alpha$ -olefin polymerization according to Claim 15, wherein the solid catalyst component further has an organic acid ester or an ether.

18. (original): The process for producing a catalyst for  $\alpha$ -olefin polymerization according to Claim 15, wherein the solid catalyst component is produced by a process comprising the step of contacting (1) a solid component having a magnesium atom, a titanium atom and a hydrocarbyloxy group, (2) a halogenocompound having halogenation ability and (3) an electron donor and/or an organic acid halide.

19. (original): A process for producing an  $\alpha$ -olefin polymer, which comprises the step of homopolymerizing or copolymerizing an  $\alpha$ -olefin in the presence of a catalyst for  $\alpha$ -olefin polymerization produced by the process according to Claim 15.